ABSTRACT

***Background**: Chronic diabetic ulcer therapy is conducted by modifying aberration local inflammatory response with drugs that act as immunomodulator, neuromodulator and growth factor stimulator. Topical medication containing zinc is one of the ingredients of topical immunomodulators aimed at modifying local immune response by stimulating or suppressing immune response.* ***Purpose**: This research aims to demonstrate microscopically both the difference of the number of macrophages on the ulcers of the oral mucosa in normal condition and in diabetic condition, as well as the difference of the number of macrophages on oral mucosal ulcer before and after the topical administration of 1% $ZnSO_4$.* ***Methods**: This study used normal and diabetic Wistar rats mice. Diabetic condition on those rats was triggered by STZ induction. Next, ulceration was created on the oral mucosa of the lower lip of those rats. Those rats then were topically administrated with 1% $ZnSO_4$ and CMC-Na gels. On the third day, those rats were killed. On the fifth day, the oral mucosa of the lower lip of those rats then was taken. Finally, the number of macrophages on the tissue was measured.* ***Results**: The number of macrophages on the oral ulcer in the diabetic condition was microscopically and significantly higher than in the normal condition. The administration of 1% $ZnSO_4$ significantly triggered the increasing of the number of macrophages in the normal and diabetic conditions on the fifth day.* ***Conclusion**: There were more macrophages in the diabetic condition than in the normal one. The administration of 1% $ZnSO_4$ significantly affected the migration of monocytes into the tissue, consequently, the monocytes altered into macrophages. As a result, the number of macrophages on the ulcer oral mucosa of Wistar rats in both conditions increased. On the fifth day, the ulcers were clinically and significantly healed.*

***Keywords :** Macrophage, Diabetes, $ZnSO_4$ 1% gel*

ABSTRAK

Latar belakang : Terapi ulkus kronis penderita diabetes adalah memodifikasi penyimpangan respon inflamasi lokal, dengan menggunakan obat-obatan yang berperan sebagai imunomodulator, neuromodulator, dan growth factors stimulator. Obat topikal yang mengandung zinc merupakan salah satu bahan topical immunomodulator bertujuan memodifikasi respon imun lokal dengan menstimulus respon imun atau menekan respon imun. **Tujuan :** membuktikan perbedaan jumlah makrofag secara mikroskopis pada ulkus mukosa mulut kondisi normal dibandingkan kondisi diabetes, serta perbedaannya setelah diberikan $ZnSO_4$ 1% secara topikal. **Metode :** Penelitian ini menggunakan hewan coba tikus Wistar kondisi normal dan tikus diabetes (induksi STZ) yang telah dibuat ulkus pada mukosa bibir bawah, kemudian diaplikasikan secara topikal gel $ZnSO_4$ 1% dan gel CMC-Na. Hewan coba dimatikan pada hari ketiga dan kelima untuk diambil mukosa bibir bawahnya, kemudian jaringan tersebut diproses menjadi preparat untuk dilakukan penghitungan jumlah makrofag. **Hasil :** Secara mikroskopis menunjukkan jumlah makrofag ulkus mulut kondisi diabetes secara bermakna lebih banyak daripada kondisi normal, serta aplikasi $ZnSO_4$ 1% topikal pada ulkus mulut meningkatkan jumlah makrofag ulkus mulut pada kondisi normal dan diabetes secara bermakna pada hari kelima. **Kesimpulan :** Jumlah makrofag kondisi diabetes lebih banyak daripada normal. Aplikasi $ZnSO_4$ 1% berpengaruh pada migrasinya monosit ke jaringan menjadi makrofag, sehingga meningkatkan jumlah makrofag ulkus mukosa mulut tikus Wistar pada kondisi normal dan diabetes pada hari kelima dan secara klinis menunjukkan kesembuhan ulkus lebih cepat.

Kata Kunci : Makrofag, Diabetes, Gel $ZnSO_4$ 1%